

# Powersports/Motorcycle Technology

Program of Studies  
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**Powersports/Motorcycle Technology**

Course Title	Post-Secondary Connection	Valid Course Code	Recommended Grade Level							Recommended Credit
			6	7	8	9	10	11	12	
Advanced Engines /Drive Systems & Lab (Motorcycle)	MOT 200	470848						X	X	1
Basic Engines / Drive Systems & Lab (Motorcycle)	MOT 142	470845						X	X	1
Diagnostics And Troubleshooting & Lab (Motorcycle)	MOT 220	470847						X	X	1
Frames And Suspensions & Lab (Motorcycle)	MOT 156	470846						X	X	1
Fundamentals Of Electricity & Lab	FEX 100	460330						X	X	1
Intro To Motorcycles	MOT 100	470844						X	X	1
Performance Machining / Welding & Lab (Motorcycle)	MOT 234	470849						X	X	1

# **POWERSPORTS/MOTORCYCLE TECHNOLOGY EDUCATION**

## **Overview of Powersports/Motorcycle Technology Education**

### **Purpose:**

The vision of Kentucky Powersports/Motorcycle Technology Education is to promote safety standards and performance standards, enhance leadership, provide relevant curriculum, and to be vital to the education of all students.

Kentucky Transportation Education will:

- Operate as the center for nationally recognized industry standard training.
- Provide a critical link in school to employment or postsecondary education.
- Develop stronger relationships with the community in terms of mutual advocacy, cooperative field experiences, employment placement, and support for relevant student organizations and competitions
- Represent an important component in the education of all students.
- Require and promote critical thinking and problem solving.
- Offer an up to date curriculum based on standards that adapts to changes in the industry.
- Integrate academic skills into the Transportation Education Curriculum in order to insure that students develop written & verbal communications skills, computational skills, and scientific/math problem-solving skills.

### **Career Pathways:**

\*Motorcycle Maintenance and Repair Technician

### **Standard Based Curriculum**

The curriculum is composed of industry standards based competencies/tasks. Therefore, the teaching/learning focus is on the final results rather than the process.

### **Kentucky Occupational Skill Standards**

The Kentucky Occupational Skill Standards are the performance specifications that identify the knowledge, skills, and abilities an individual needs to succeed in the workplace. Identifying the necessary skills is critical to preparing students for entry into employment or postsecondary education. These standards described the necessary **occupational**, **academic**, and **employability** skills needed to enter the workforce or post- secondary education in specific career areas. There is an ongoing effort to continue to refine these standards by which exemplary Transportation Education Programs are evaluated and certified. This helps insure that curriculum meets industry specifications.

### **Work Based Learning**

Cooperative experience, internships, shadowing and mentoring opportunities provide depth and breadth of learning in the instructional program and allow students to apply the concepts learned in the classroom. The Work Base Learning Guide is available on the KDE webpage: [www.education.ky.gov](http://www.education.ky.gov).

### **Student Organizations and Competitions**

Participation in Skills USA and the Ford AAA Auto Skills Competition provides a vehicle for students to employ higher order thinking skills, to interact with high-level industry people and to further enhance their leadership skill through their participation in regional, state and national competitive events and local activities.

## MOTORCYCLE/POWERSPORTS PATHWAYS

Career Pathway	Pathway Courses	Elective Courses
<p>Motorcycle Maintenance and Repair Technician</p> <p>CIP Code 47.0611.00</p> <p><u>Tests for Certification</u></p> <p>EETC 4 Stroke Engine</p> <p>EETC 2 Stroke Engine</p> <p>EETC Electrical</p>	<p><i>*ADVANCED ENGINES /DRIVE SYSTEMS &amp; LAB(MOTORCYCLE)</i></p> <p><i>*BASIC ENGINES / DRIVE SYSTEMS &amp; LAB (MOTORCYCLE)</i></p> <p><i>*DIAGNOSTICS AND TROUBLESHOOTING &amp; LAB (MOTORCYCLE)</i></p> <p><i>*FRAMES AND SUSPENSIONS &amp; LAB (MOTORCYCLE)</i></p> <p> </p> <p><i>NOTE: The FUNDAMENTALS OF ELECTRICITY &amp; LAB INTRODUCTION TO MOTORCYCLES course must be completed before a student can begin the Motorcycle Maintenance and Repair Technician Pathway.</i></p>	<p>No Electives</p>

## Sample Motorcycle/Powersports Career Pathway

KENTUCKY CAREER PATHWAY/PROGRAM OF STUDY TEMPLATE									
COLLEGE/UNIVERSITY: HIGH SCHOOL (S):						CLUSTER: Transportation PATHWAY: PROGRAM: Motorcycle/ATV Repair Technology			
GRADE	ENGLISH	MATH	SCIENCE	SOCIAL STUDIES	CAREER AND TECHNICAL EDUCATION COURSES	REQUIRED COURSES RECOMMENDED ELECTIVE COURSES OTHER ELECTIVE COURSES	CREDENTIAL CERTIFICATE DIPLOMA DEGREE	SAMPLE OCCUPATIONS	
9	English I	Algebra I	Earth Science	World History	Health & PE	Computers	Word Processing		
10	English II	Geometry	Biology	US History	Elective	Spreadsheets	Accounting		
11					(MOT 100) Introduction to Motorcycles FEX 100 Fundamentals of Electricity	(MOT 142) Basic Engines and Drive Systems (WPP 200) Workplace Principles			
12	English III	Algebra II	Introduction to Chemistry	Foreign Language	(MOT 156) Frames and Suspensions MOT 220 Diagnostics and Troubleshooting	(MOT 234) Performance Machine and Welding (MOT 200) Advanced Engines and Troubleshooting	• Equipment & Engine Training Council Certification o Two Stroke o Four Stroke	Motorcycle/AT V Repairer, Motorcycle Saleperson,	
English IV	Foreign Language		Introduction to Physics	Arts & Humanities					
Year 13									
	Writing	Math	Social Interaction	Heritage/ Humanities	Computer Literacy	(MOT 120) Motorcycle Sales and Marketing (BA 200) Small Business Management	(MOT 130) Shop Management (MOT 134) Service Requirements		
Year 14						(OST 105) Introduction to Information Systems (MOT 244) Parts and Management	(ACC 201) Financial Accounting	Motorcycle/AT V Repairer, Motorcycle Saleperson, Shop Foreman, Shop Owner, Parts Sales, Sales Representative	
Year 15	Oral Com	Elective	Science	Elective	Co-op		AAS Degree		
Year 16									
POSTSECONDARY									
AAS Degree will transfer into the BS degree in Technology Management at Morehead State University									
AAS Degree will transfer into the BS degree in Technology Management at Morehead State University									
Required Courses									
Recommended Elective Courses									
Other Elective Courses									
Career and Technical Education Courses									
Credit-Based Transition Programs (e.g. Dual/Concurrent Enrollment, Articulated Courses, 2+2+2) (♦=High School to Comm. College) (* =Comm. College to 4-Yr Institution) (= Opportunity to test out)									
Mandatory Assessments, Advising, and Additional Preparation									
October, 2006 CTE/Kentucky									

# **Powersports/Motorcycle Courses/Tasks**

## **Fundamentals of Electricity & Lab (Powersports/Motorcycle)**

**Valid Course Code:**

**460330**

### **Course Description**

This course introduces students to the basic physics of electricity. Students apply Ohm's Law; measure resistance, voltage, ohms, watts and amps; construct various types of electrical circuits; select wire and fuse sizes; and learn to trouble shoot an electric motor and coil.

### **Content/Process**

Student Will:

1. Practice electrical safety.
2. Measure ohms with an ohmmeter.
3. Measure voltage with a voltmeter.
4. Measure amps with an ammeter.
5. Measure watts with a wattmeter.
6. Solve electrical circuit problems using Ohm's Law.
7. Draw and interpret electrical symbols.
8. Demonstrate series circuits, parallel circuits and series-parallel circuits.
9. Select wire and fuse sizes.

### **Connections:**

\*Common Core State Standards  
\*KOSSA  
\*Common Core Technical Standards  
\*New Generation Science Standards  
\*Post-Secondary: KCTCS FEX 100  
\*CTSO's – Skills USA

## **Introduction to Motorcycles**

**Valid Course Code:**

**470844**

### **Course Description**

Explores culture and history of motorcycles. Includes possible field trips to dealerships for student exploration into motorcycle industry.

### **Content/Process**

Students Will:

1. Explain knowledge of early motorcycles.
2. Identify important developments in the motorcycle industry.
3. Explain the impact of foreign companies on the motorcycle industry
4. Identify the key component of motorcycle construction.
5. Identify various motorcycle organizations, their projects and activities.
6. Identify different types of motorcycles.
7. Identify restrictions to access and speed in motorcycles.

### **Connections:**

\*Common Core State Standards  
\*KOSSA  
\*Common Core Technical Standards  
\*New Generation Science Standards  
\*Post-Secondary: KCTCS MOT 100  
\*CTSO's – Skills USA

## **Basic Engines and Drive Systems & Lab**

**Valid Course Code:**

**470845**

### **Course Description**

Explores professional work habits, proper use of hand and power tools, service manuals, basic engine and parts identification. Covers internal combustion engines, transmissions, fuel systems, and assembly and disassembly.

### **Content/Process**

**Students Will:**

1. Use proper tools to service an engine.
2. Demonstrate an understanding of camshaft design engines
3. Demonstrate an understanding of single cylinder engines.
4. Demonstrate an understanding of twin cylinder engines.
5. Demonstrate an understanding of multi-cylinder engines.
6. Service all types of engines using proper techniques and tools.
7. Disassemble single, twin cylinder engines.
8. Assemble single, twin cylinder engines
9. Inspect and repair pistons.
10. Inspect and repair valves.
11. Inspect and repair fuel injection systems.
12. Inspect and repair electronic systems.

### **Connections:**

\*Common Core State Standards

\*KOSSA

\*Common Core Technical Standard

\*New Generation Science Standards

\*Post-Secondary: KCTCS MOT 142

\*CTSO's – Skills USA



## **Frames and Suspensions & Lab (Powersports/Motorcycles)**

**Valid Course Code:**

**470846**

### **Course Description**

Focuses on the design, operation, maintenance, and geometry of motorcycles. Explores basic principles of hydraulics and lubricants. Includes basic adjustments of all frame and suspension components

### **Content/Process**

Students Will:

1. Change and repair wheels and tires.
2. Demonstrate proper maintenance techniques.
3. Demonstrate an understanding of frame design.
4. List types of frames.
5. Adjust steering systems.
6. Install shocks, springs, and swing arms.
7. Change drum and disc brakes.
8. Demonstrate an understanding of hydraulic and manual brakes.
9. Repair wheel components.
10. Repair and install tires.
11. Inspect and service brake systems.
12. Inspect and repair suspensions
13. Inspect and repair frame components.

### **Connections:**

\*Common Core State Standards

\*KOSSA

\*Common Core Technical Standard

\*New Generation Science Standards

\*Post-Secondary: KCTCS MOT 156

CTSO's – Skills USA

**Advanced Engines / Drive Systems & Lab (Powersports/Motorcycle)**  
**Valid Course Code:**  
**470848**

<b>Course Description</b>	
Develops skills for engine and transmission overhaul. Emphasizes assembly and disassembly of all components of engine and transmission.	
<b>Content/Process</b>	
<p>Students Will:</p> <ol style="list-style-type: none"><li>1. Disassemble engine components.</li><li>2. Inspect engine components.</li><li>3. Demonstrate shop safety while conducting disassembly and reassembly.</li><li>4. Disassemble transmission components.</li><li>5. Inspect transmission components.</li><li>6. Disassemble twin and multi-cylinder engines.</li><li>7. Assemble twin and multi-cylinder engines.</li><li>8. Repair single overhead camshaft.</li><li>9. Repair dual overhead camshaft.</li><li>10. Inspect and repair fuel injection systems.</li><li>11. Inspect and repair electronic systems.</li></ol>	
<b>Connections:</b>	
<ul style="list-style-type: none"><li>*Common Core State Standards</li><li>*KOSSA</li><li>*Common Core Technical Standard</li><li>*New Generation Science Standards</li><li>*Post-Secondary: KCTCS MOT 200</li><li>*CTSO's – Skills USA</li></ul>	

**Diagnostics and Troubleshooting & Lab (Powersports/Motorcycle)**  
**Valid Course Code:**  
**470847**

<b>Course Description</b>	
Focuses on appropriate procedures used in diagnosing customer concerns	
<b>Content/Process</b>	
Students Will:	
1	Demonstrate an understanding of service manuals.
2	Use proper equipment to diagnose a problem.
3	Identify problems.
4	Follow troubleshooting procedures.
5	Identify and use service manuals.
6	Utilize diagnostic equipment to analyze motorcycles.
7	Systematically troubleshoot problems to identify and resolve.
<b>Connections:</b>	
*Common Core State Standards	
*KOSSA	
*Common Core Technical Standard	
*New Generation Science Standards	
*Post-Secondary: KCTCS MOT 220	
*CTSO's – Skills USA	

**Performance Machining and Welding & Lab**  
**Valid Course Code:**  
**470849**

**Course Description**

Explores standard and performance-machining practices associated with performance motorcycles. Includes machining practices associated with valve jobs, cylinder boring and honing, big bore kits, and cylinder head porting and polishing. Covers basic welding and weld inspection practices.

**Content/Process**

Students Will:

- 1 Demonstrate proper welding techniques.
- 2 Demonstrate an understanding of welding equipment.
- 3 Demonstrate basic machining practices associated with valve jobs and cylinder head porting and polishing.
- 4 Demonstrate proper cylinder boring and honing techniques.
- 5 Identify proper welds.
- 6 Use proper tools for each task.
- 7 Demonstrate the proper care and handling of machining tools.
- 8 Demonstrate the proper care and handling of welding tools.
- 9 Setup welding project using proper safety techniques.
- 10 Perform aluminum welds.
- 11 Setup machining project using proper safety techniques.
- 12 Clean and maintain machining equipment.
- 13 Perform basic machining operations.

**Connections:**

\*Common Core State Standards  
\*KOSSA  
\*Common Core Technical Standard  
\*New Generation Science Standards  
\*Post-Secondary: KCTCS MOT 234  
\*CTSO's – Skills USA